

**ABSTRACT**

A charging circuit is provided for coupling a power source to a plurality of loads. The circuit includes a controller that continually senses the output voltage of the power source. The controller may also decouple the power source from the loads to measure the open circuit voltage  
5 of the power source. Once the open circuit voltage is known, the controller establishes a threshold voltage that is slightly below the open circuit voltage of the power supply. The controller then begins delivering current to one of the loads by way of a current regulator. Whenever the power source voltage is below the threshold voltage, the controller reduces the current flowing through the current regulator. When the power source voltage is above the  
10 threshold voltage, the controller increases the current flowing through the current regulator. In so doing, the charging circuit simultaneously charges both loads, thereby reducing overall charge time.